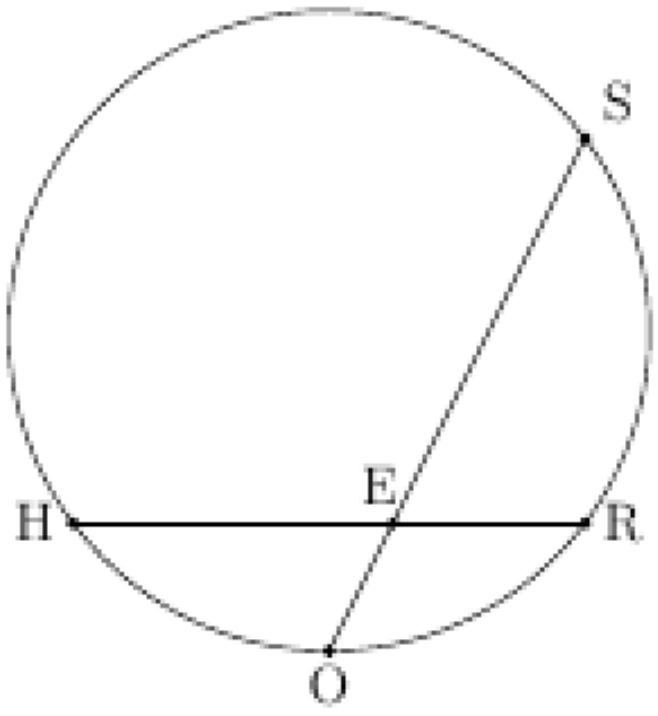
Topic: Vertex on, inside, and outside the circle

Question: Find the angle measure.

In the circle, arc $SR = 90°$ and arc $OH = 50°$. What is $m\angle REO$?



Answer choices:

A $50°$

B $70°$

C $90°$

D $110°$

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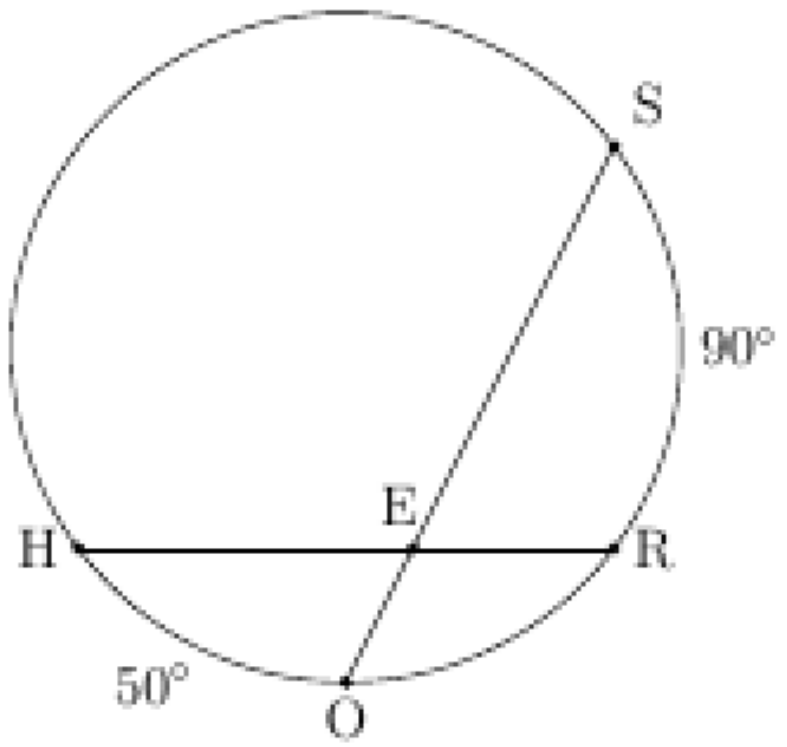
Solution: D

We can find the measure of $\angle HEO$ given the arc lengths we already know.

$$m\angle HEO = \frac{1}{2}(\text{arc } HO + \text{arc } SR)$$

$$m\angle HEO = \frac{1}{2}(50^\circ + 90^\circ)$$



$$m\angle HEO = 70^\circ$$

Because $\overline{HR}$ is a straight line,

$$m\angle HEO + m\angle REO = 180^\circ$$

$$m\angle REO = 180^\circ - 70^\circ = 110^\circ$$

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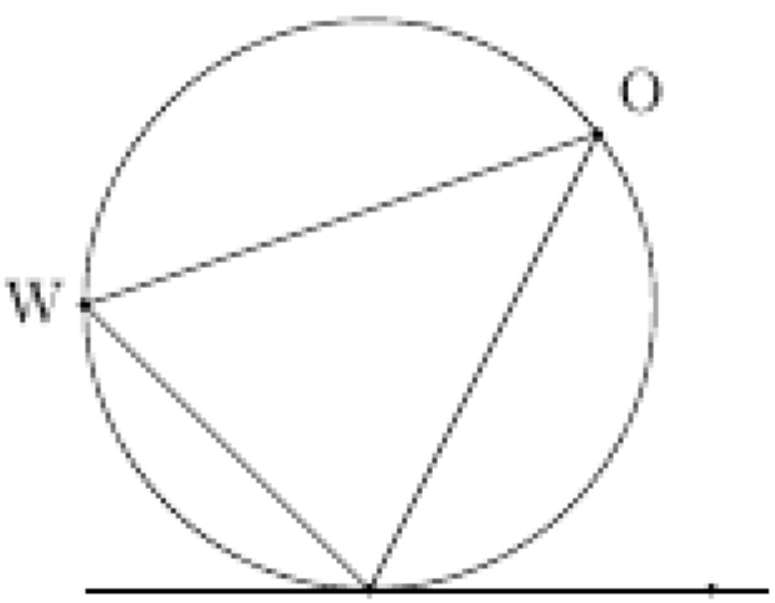
Topic: Vertex on, inside, and outside the circle

Question: Find the angle measure.

In the circle, $m\angle O = 40°$ and $m\angle OLW = 80°$. Also, $\overline{LF}$ is tangent to the circle at L. What is $m\angle OLF$?



Answer choices:

A $30°$

B $40°$

C $50°$

D $60°$

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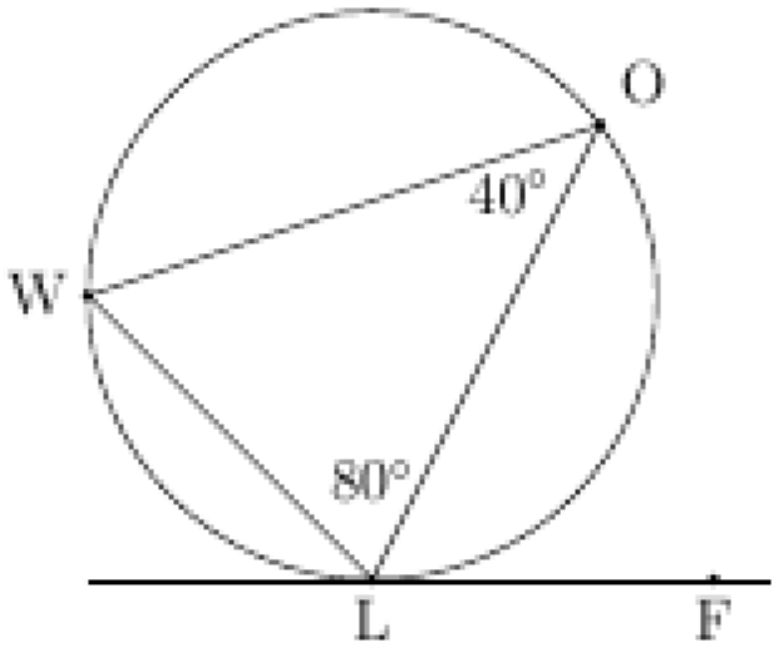
Solution: D

In $\triangle OWL$ the three angles total $180°$. We know that two of them are $40°$ and $80°$.



Those two total $120°$, which leaves $60°$ for $m\angle W$. $\angle W$ is an inscribed angle of $60°$ so its intercepted arc $OL = 120°$.

$\angle OLF$ has its vertex on the circle, so its measure is half its intercepted arc.

Half of a $120°$ arc is $60°$, so $m\angle OLF = 60°$.

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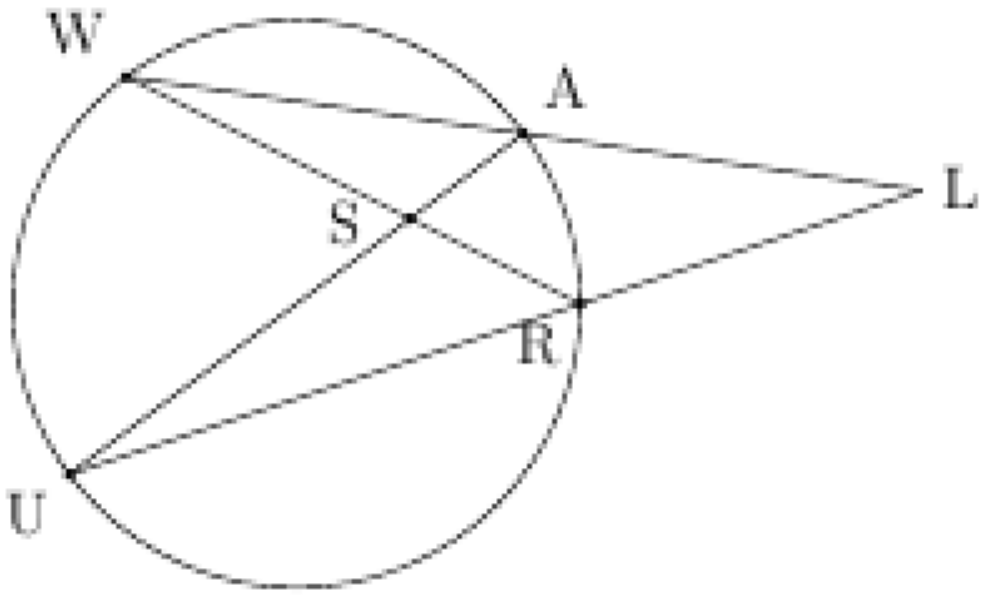
Topic: Vertex on, inside, and outside the circle

Question: Find the angle measure.

In the circle, $m\angle W = 20°$ and $m\angle ASR = 75°$. What is $m\angle L$?



Answer choices:

A $30°$

B $35°$

C $40°$

D $45°$

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Solution: B

First we'll find the measure of arc AR.

$$\angle W = \frac{1}{2}\text{arc } AR$$

$$20^\circ = \frac{1}{2}\text{arc } AR$$

$$\text{arc } AR = 40^\circ$$

Now we'll use this to find the measure of arc WU.

$$m\angle ASR = \frac{1}{2}(\text{arc } WU + \text{arc } AR)$$

$$75^\circ = \frac{1}{2}(\text{arc } WU + 40^\circ)$$

$$150^\circ = \text{arc } WU + 40^\circ$$

$$110^\circ = \text{arc } WU$$

Finally, we can solve for $m\angle L$.

$$m\angle L = \frac{1}{2}(110 - 40) = 35^\circ$$

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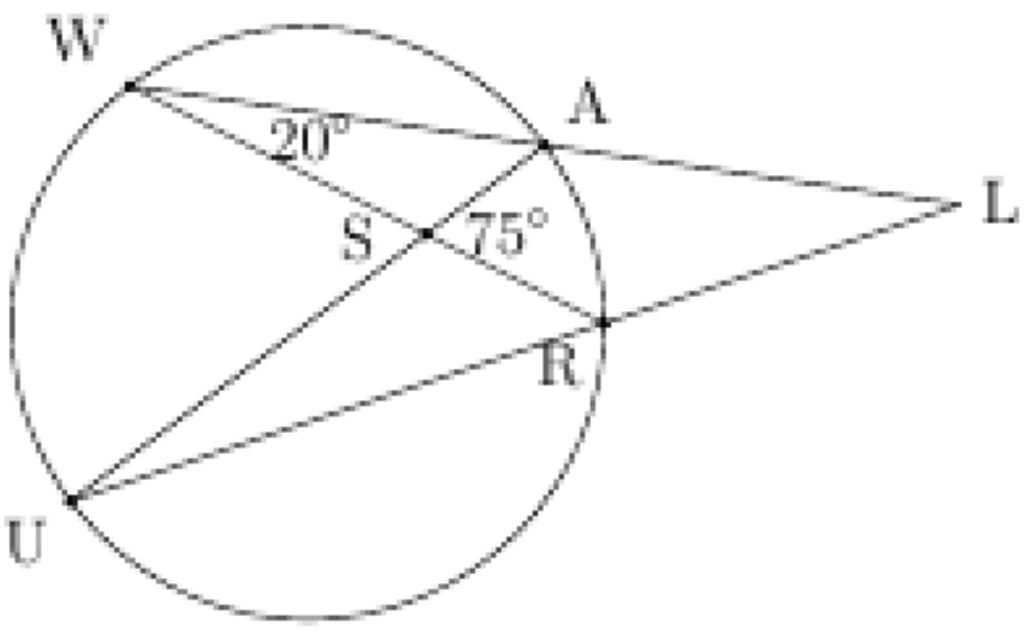

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